Green Supply Chain Management and Competitive Advantage: Evidence of Just-in-time Management on Firm Performance SMEs in Indonesia

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Abstract

The turnaround of the wheels of the economy has an important meaning in terms of accelerating development in Indonesia. This industrial sector not only has the potential to make a large economic contribution through added value, employment and foreign exchange, but also is able to make a major contribution in the cultural transformation of the nation towards modernizing people's lives that support the formation of national competitiveness. This study aims to test the influence of just in time, green supply chain management, and competitive advantage on company performance in SMEs in Indonesia. This study used a quantitative approach with a data collection method using a 1-5 Likert scale questionnaire which was distributed online and processed using SPSS version 25 software. The population and sample of this study are 175 SMEs in Indonesia which are engaged in the manufacturing sector. As for testing the model in this study using the Structural Equation Model Partial Least Square (SEM PLS). The results of this study provide the fact that the just-in-time system, green supply chain management, and competitive advantage have a significant positive effect on the performance of SMEs companies in Indonesia, both directly and indirectly. Recommendations that can be given to the company are to maintain the just-in-item system that has been carried out such as managing production costs, maintaining production levels, and providing good relations to suppliers. Not only that, companies must also continue to protect the surrounding environment by enacting environmentally friendly policies.

Keywords: just-in-time, green supply chain management, competitive advantage, firm performance, SMEs

Introduction

The role of the industrial sector in the rotation of the wheels of the economy has an important meaning in terms of accelerating development in Indonesia. This sector not only has the potential to make a large economic contribution through added value, employment and foreign exchange, but also is able to make a major contribution in the cultural transformation of the nation towards modernizing people's lives that support the formation of national competitiveness. The increase in industrialization causes environmental degradation and poses a significant threat to the surrounding environment, therefore a green industry concept is needed in every business process(Puryono and Sudiatri, 2019). The concept of green industry can be applied in every business process by business owners engaged in the industrial sector, especially in the supply chain known as green supply chain management. The supply chain is a network of all organizations from suppliers to end users in which there is a flow and transformation of materials, information, and money (Heizer and Render, 2014). Every activity carried out by supply chain managers has the opportunity to create waste and hazardous materials for the surrounding environment. Therefore, the concept of green supply chain management is suitable for use in overcoming environmental problems in the supply chain that lead to company performance (Lahcen et al., 2021).

Mughal, (2019) Green Supply Chain Management (GSCM) is a traditional supply chain concept that is integrated with environmental aspects which include product design, supplier selection, material procurement, manufacturing activities, packaging activities, product delivery activities to consumers, and the end of life product, namely the consumer himself. Currently, the implementation of Green supply chain management has begun to be implemented by all sectors and business scales, including Small and Medium Enterprises(Heriyanto and Noviardy, 2019). Discussing GSCM is closely related to company performance. Talking about GSCM is closely related to how the company is able to solve the problem of residual materials after operational activities(Forbes et al., 2009). The application of just-in-time is believed to be able to overcome the problems faced by the company(Piercy and Rich, 2015). This is in line with the findings of the research conducted by(Green et al., 2019)which reveals that JIT is an upgrade program designed to eliminate forms of waste from supply, production and delivery processes, and promote optimal use of resources that impact environmental sustainability. In line with that, JIT is also interpreted as one of the differentiating ways to improve company performance. This certainly makes the implementation of good JIT one of the ways companies can compete with similar competitors(Bodgan and Taylor, 1992; Ramlawati, 2018).
Through the Ministry of Cooperatives and MSEs of Indonesia stated that currently the number of SMEs in Indonesia is 65 million and 19.5 million SMEs actors have moved and integrated one and another. The large number of SMEs in Indonesia shows that it is in line with the increase in waste from production activities that can interfere with environmental sustainability. Conditions like this indicate that there must be a good and correct implementation of GSCM, where green supply chain management integrates supply chain management with environmental management, so it is important for all industrial sectors to do so because it can reduce environmental impacts and can also create competitiveness and high performance.

**Literature Review**

**Green Supply Chain Management**

The term green supply chain or better known as Green Supply Chain Management (GSCM) is a traditional supply chain concept that is integrated with environmental aspects which include product design, supplier selection, material procurement, manufacturing activities, packaging activities, product delivery activities to consumers, and end of product use Mughal, (2019). GSCM is part of a strategy innovation in the supply chain based on an environmental context that includes activities such as reduction, recycle, reuse, and material substitution(Lahcen et al., 2021). In its implementation, GSCM has operational functions and supporting activities including: (1) green procurement, (2) green manufacturing, (3) green distribution, and (4) reverse logistics(Changas et al., 2016).

**Just in Time**

Just-in-time (JIT) is a manufacturing philosophy that originated in Toyota, Japan and is used as an identification and reduces waste through continuous improvement (Bashar and Hasin, 2019). JIT has been widely studied and is of particular concern to both academics and practitioners to reduce the level of inventory of raw materials, goods in progress and finished goods (Heizer and Render, 2014). Currently JIT has been implemented in developed countries as a way to reduce the adverse impacts that occur during operational activities (Isa and Yew Keong, 2008; Salehi, Alipour and Ramazani, 2010).

**Competitive Advantage**

Competitive advantage or better known as competitive advantage is the ability to create more economic value than competitors (Heizer and Render, 2014). Competitiveness is a concept that refers to the company's skills in competing with other companies for a position in the market share(Jamaludin, 2021). Competitiveness can be improved and created through the application of the right competitive strategy, namely by managing resources effectively and efficiently, and must be adjusted to all activities of a company function, so that later the creation of company performance which is expected to be even more able to produce a value (Elijah and Millicent, 2018).

**Firm Performance**

Company performance is a management activity and shows an overview of the extent to which the results that have been achieved in a certain period are measured based on comparisons with the standards desired by the company(Heizer and Render, 2014). In principle, the performance of the company as a measure of the extent to which the company determines the activity of operations. Basically, in measuring company performance, it can be distinguished based on profit oriented and non-profit oriented(Ma, 2000).

**Relationships between variables**

Just-in-time is one of the ways companies control so that there is no waste(Heizer and Render, 2014). Several studies have revealed a just-in-time relationship with the application of GSCM. Empirical evidence put forward by (Piecry and Rich, 2015)a group of companies in Australia are leveraging JIT’s existing capabilities to support environmental sustainability efforts by producing environmentally friendly ones. Other evidence was revealed by Green et al., (2019) proving that JIT is an upgrade program designed to eliminate forms of waste from supply, production and delivery processes, and promote optimal use of resources that impact environmental sustainability.

Nowadays, all operational activities in manufacturing companies have realized that environmental sustainability for the long term is something that should not be taken lightly. The concept of green industry can be applied in every business process by business owners engaged in the industrial sector, especially in the supply chain known as green supply chain management. There have been many research studies that reveal that the existence of GSM has a good influence on the sustainability of operational activities in manufacturing companies. Research conductedNovitasari & Agustia, (2021)revealed that the existence of green innovation in operational activities such as technology to create environmentally friendly products will increase marketing and sales to create reliable company performance. This is certainly in line with the research conductedHeriyanto & Noviard, (2019)that by carrying out such as guaranteeing the use of appropriate raw materials, supervising environmental risks and managing the flow of immunization from raw materials / materials can have a high influence on the company's performance.

The success of the company's performance is inseparable from the factors that influence it, one of which is by implementing good green supply chain management (Mughal, 2019). Today awareness of environmental sustainability has increased among consumers. It is expressed byForbes et al., (2009)that consumers have increased the demand for sustainable products with increased awareness regarding environmental sustainability. Several studies have revealed a good relationship between GSCM and company performance. Such as the research conductedJassim et al., (2020)by running GSCM sustainably in accordance with consumer demand, it has a good impact on the company's performance, one of which is that profits have increased. There have been many ways to be able to improve the performance of companies in the manufacturing sector. One of them is to control the company in accordance with the needs of the company. The existence of JIT is able to help companies multiply problems such as instability in the supply of raw materials, production process times that are not in accordance with the schedule to delays in the delivery of products to consumer hands(Wang, Chen and Chang, 2011).
Other research reveals that by implementing a good JIT will give rise to more power not only in non-financial aspects but also in the natural aspects of finance (Salehi, Alipour and Ramazani, 2010). On the other hand, the factor that can improve the company's performance is the application of competitive advantage which is a differentiator from competitors (Ariyawardana, 2003). Research conducted by Do & Nguyen, (2020) provides empirical evidence that the implementation of a proactive environmental strategy generates competitive advantages of deference and cost advantage, which is in improving the company's performance both in the short term (i.e., product, financial performance and production) and long-term (i.e., strategic performance).

The conceptual framework is built based on the collaboration of theories and the results of previous research as follows:

**Figure 1: Research Conceptual Framework**

Based on the explanation of the relationship between the variables described above, the researcher proposed the following hypothesis:

- **H1**: Just-in-time has a positive effect GSCM
- **H2**: GSCM has a positive effect performance firm
- **H3**: Just-in-time has a positive effect competitive advantage
- **H4**: Just-in-time has a positive effect firm performance
- **H5**: Competitive advantage has a positive effect firm performance
- **H6**: Just-in-time has a positive effect firm performance through GSCM
- **H7**: Just-in-time has a positive effect firm performance through competitive advantage

**Methodology**

This research uses an explanatory quantitative approach, namely research that is based on a theory or hypothesis that will be used to test a phenomenon that occurs (Cooper & Schindler, 2014). The main reason for choosing this type of explanatory research is to test the hypothesis proposed in order to explain the influence of independent variables (green supply chain management, competitive advantage, and just in time) on dependent variables (firm performance) both partially and simultaneously. Data collection was carried out by distributing questionnaires online using Likert scale measurements of 1-5. The population of this study is SMEs that focus on manufacturing activities in Indonesia. The determination of samples in this study used non-probability because the population size could not be clearly identified. As for determining the minimum number of samples with variables ≤5, the number of samples is 100, while for variables ≤ 7 at least 150, and variables ≥7 as many as 300 (Hair et al., 2014). Variable green supply chain management is measured using 4 indicators (green procurement, green manufacturing, green distribution, and reverse logistics) adapted (Rupa and Saif, 2022). The just-in-time variable is measured using 3 indicators, namely (production costs, productivity levels, and the company's relationship with suppliers) which are adapted (Heizer and Render, 2014). Competitive advantage is measured using 5 indicators (price, quality, delivery dependability, product innovation, and time to market) adapted from research (Miguel and Brito, 2011) and Company performance is measured using 2 indicators (operational performance and company performance) based on research adaptation (Saad and Siddiqui, 2019). This study used SPSS Version 25 software as a tool for data processing, and to test the research model using SEM Partial Least Square (PLS) with SmartPLS software. PLS is also used to measure the relationship of each indicator to its construct. In addition, PLS can also be used for confirmation purposes, such as hypothesis testing and exploratory purposes.

**Result**

**Demography Respondent**
The data in the table provides respondents’ data information including gender, age, job position, education, and business income in the month period. The results of data processing showed that male respondents dominated by 71.42% compared to women. Based on age, respondents with an age range of 24–27 years were dominant compared to others. This proves that the age range is the productive age in working and running a business. Furthermore, the job position is dominated by the manager / owner as a responsibility in decision making. In the background of education, it is dominated by Strata 1 by 55.42%. In terms of revenue in a month, it dominates the range of 10,000,000 – 15,000,000 by 40%.

**Table 1 : Frequency distribution of demographic respondents** *(n =175)*  
*Source : own primary data (2022)*

<table>
<thead>
<tr>
<th>Information</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>125</td>
<td>71.42%</td>
</tr>
<tr>
<td>Woman</td>
<td>50</td>
<td>28.58%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 – 23 years old</td>
<td>43</td>
<td>24.57%</td>
</tr>
<tr>
<td>24 – 27 years old</td>
<td>80</td>
<td>45.571%</td>
</tr>
<tr>
<td>&gt; 27 years old</td>
<td>52</td>
<td>29.71%</td>
</tr>
<tr>
<td>Job Position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manager/ owner</td>
<td>138</td>
<td>78.85%</td>
</tr>
<tr>
<td>Employee</td>
<td>37</td>
<td>21.14%</td>
</tr>
<tr>
<td>Education Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior High School</td>
<td>28</td>
<td>16%</td>
</tr>
<tr>
<td>Diploma</td>
<td>50</td>
<td>28.57%</td>
</tr>
<tr>
<td>Bachelor</td>
<td>97</td>
<td>55.42%</td>
</tr>
<tr>
<td>Revenue (Month)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5,000,000 – 10,000,000</td>
<td>30</td>
<td>17.14%</td>
</tr>
<tr>
<td>10,000,000 – 15,000,000</td>
<td>70</td>
<td>40%</td>
</tr>
<tr>
<td>15,000,000 – 20,000,000</td>
<td>40</td>
<td>22.85%</td>
</tr>
<tr>
<td>&gt;20,000,000</td>
<td>35</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Construct Validity and Reliability Test**

From the results of data processing obtained by respondents, all indicators that form the variables studied have an outer loading value and an average variance extract of > 0.5. The stages can be continued and it is said that the research model is said to be good if the AVE value > 0.5 (Ghozali, 2013). Furthermore, table 3 shows the Composite Reliability Test Results from the data that has been processed. According to Chin, (2010) Good research is expected to be composite reliability value > 0.7. Based on the results of data processing, it was found that all variables studied had a composite reliability value of > 0.7.

![Figure 2: Data Processing Results using SmartPLS](image-url)
Goodness of Fit Model

Each endogenous variable expressed with an R value of 0.591 or 59.1% of Green Supply Chain Management (GSCM) is influenced by Just-in-time (JIT).

The endogenous variable Competitive Advantage (CA) is valued at 0.657 or 65.7% Competitive Advantage (CA) is influenced by Just-in-time (JIT).

The endogenous variable Firm Performance (FP) value of 0.629 or 62.9% firm performance (FP) is influenced by Just-in-time (JIT), Green Supply Chain Management (GSCM), and Competitive Advantage (CA).

And the predictive relevance value (Q²) can be calculated as follows:

\[
Q^2 = 1 - (1 - R_{12}^2)(1 - R_{22}^2) (1 - R_{32}^2)
\]

Based on the calculation results, it shows a Q² value of 0.835 so the model deserves to be declared as predictive-relevance. The magnitude of 83.5% describes the diversity of data that can be described by the Partial Least Square model or the information contained in the data can be explained by the model. Meanwhile, 16.5% is explained by other variables outside the variables studied.

Hypothesis Testing

| Variable | Coefficient | Sample Mean (M) | T Statistics (|O/STDEV|) | P -Values | Hypothesis |
|----------|-------------|----------------|----------------|-----------|------------|
| JIT -> GSCM | 0.769 | 0.771 | 23.071 | 0.000 | Supported |
| GSCM -> FP | 0.214 | 0.222 | 2.111 | 0.035 | Supported |
| JIT -> CA | 0.811 | 0.813 | 25.945 | 0.000 | Supported |
| JIT -> FP | 0.113 | 0.155 | 2.031 | 0.064 | Supported |
| CA -> FP | 0.521 | 0.522 | 6.934 | 0.000 | Supported |
| JIT -> GSCM -> FP | 0.165 | 0.172 | 2.066 | 0.039 | Supported |
Discussion

This research provides empirical evidence that the performance of SMEs companies in Indonesia influenced by just in time, green supply chain management, and competitive advantage. Of the 7 hypotheses proposed by the researcher are not all accepted. Hypothesis 1, namely just in time, has a positive effect on GSCM. The JIT system is the company’s effort to reduce and is designed to eliminate forms of waste from the supply chain processes carried out by the company. Elements contained in JIT such as production costs, product levels and supplier relationships support an expanded focus on environmental sustainability through green supply chain management practices. These findings are in line with previous research conducted by Inman et al. (2011); Inman & Green, (2018) that there is a powerful relationship between JIT and the application of green supply chains.

Hypothesis 2 reveals empirical evidence that GSCM is integral to the performance of SMEs companies in Indonesia. Internal environmental management, cooperation with customers, and environmentally friendly design are important concerns for manufacturing business players in Indonesia. Environmental sustainability issues are currently a topic that is being discussed. Companies that implement and care about the green environment in the community get enthusiasm and good research by the public. The findings of this study are strengthened by previous research conducted by Mughal, (2019) in Jordan that with special attention to the surrounding environment in the company gives an impact on the good relationship between eco design and company performance, as well as on the relationship between internal environmental management and company performance. Further similar things were also expressed by Jassim et al., (2020); Marhamati & Azizi, (2020) that enforcing internal and external practices has a positive and significant impact on the company's performance in the manufacturing sector. It can be concluded that the better the company’s management manages GSCM, the higher the company’s performance.

Hypotheses 3 and 4 have an empirical influence that JIT not only affects company performance but also affects competitive advantage. This shows that the process of limiting production costs, keeping production levels stable and participating in maintaining good relations with suppliers will have a good impact on improving the company’s performance. The implementation of just-in-time and being able to respond to production activities is important in order to maintain the sustainability of the company. For this reason, it is important to have a good just-in-time implementation in an effort to maintain the company’s performance to be stable and even increase. The results of this study support previous research conducted by Salehi et al., (2010) that by setting just-in-time on Iranian state enterprises will give rise to more power not only in the aspect of financial but also non-financial performance. The results of this study also support the empirical findings carried out by Sa’da & Yew Keong, (2008) that there is a positive relationship between JIT and company performance and there are significant differences in manufacturing companies that implement JIT and non-JIT. The same thing was said by Masudin & Kamara, (2018); Wang et al., (2011) concluded that the application of supply chain management innovation approaches such as JIT provides a significant impact on company performance.

Meanwhile, by enacting JIT, it is one of the strategies or advantages of the strategy owned by the company. The relationship of determining production costs, relationships with customers makes it difficult for companies in pricing products, shipping processes, maintaining product quality and in carrying out renewal innovations. The research by Al-awaqleh, (2012); Ramlawati, (2018); Taylor et al., (2007) revealed that there is a positive and statistically significant relationship between the implementation of the JIT system and the achievement of competitiveness in the manufacturing industry.

Hypothesis 5 shows evidence that competitiveness affects company performance. The ultimate goal in a company's success process is to maximize its performance. Maximizing performance can be done by companies in various ways to get it. One of them is the implementation of the competitive advantage strategy. The results of this study reveal that the competitive advantages that have been carried out by SMEs in Indonesia have implications for the company’s performance. Such as pricing, maintaining quality, fast delivery of goods and product innovation are stated to be able to improve company performance. The findings of this study support the research conducted by Ariyawardana, (2003) that the selection of the right competitive advantage will improve the company’s performance. Furthermore, the same thing was also revealed by Do & Nguyen, (2020) The implementation of a proactive environmental strategy results in a competitive advantage of differentiation and a cost advantage. Furthermore, the competitive advantage of differentiation improves the company’s performance both in the short term (that is, product, financial and production performance) and in the long term (that is, strategic performance). This can be interpreted The better the competitive advantage implemented by the company, the higher the company’s performance produced by Elijah and Millicent, 2018; Jamaludin, 2021; Roz, 2021

In this study, the indirect influence described in JIT hypotheses 6 and 7 on the performance of SME’s companies in Indonesia mediated by GSCM and competitive advantage. The results of the two mediation variables are stated to be able to mediate the influence of JIT relations on company performance. The selection of green supply chains is considered to have a good impact on the JIT system to improve company performance. This research is in line with the research that has been carried out by Green et al., (2019); Bashir & Hasin, (2019) that the implementation of JIT directly provides a positive relationship with green supply chain management practices and as a complement in a greater combination of the results of work in the company. The results of indirect relationships are also obtained in competitive advantage as a mediator of JIT influence on company performance. The selection of a competitive advantage strategy supports the existence of a JIT system relationship to improve company performance. These findings are supported by empirical evidence Ma, (2000); Potanajarawit, (2018); Ramlawati, (2018)selection such as price, maintaining product quantity, delivery, product innovation and time to market provides good results in the JIT system on the company’s performance.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Coefficient</th>
<th>t-value</th>
<th>Significance</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>JIT -&gt; CA -&gt; FP</td>
<td>0.423</td>
<td>6.588</td>
<td>0.000</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Table 4: Hypothesis Testing Results (n = 175)
Source: own primary data (2022)
Conclusions and Recommendation

In the research that has been carried out, it is known that just in time, green supply chain management, competitive advantage has a positive and significant effect on SMEs in Indonesia. The positive direction shows that the implementation of a just-in-time system, the implementation of a green supply chain, and the selection of a good competitive advantage strategy will improve the company's performance in MSMEs in Indonesia not only from the financial and non-financial side. In addition, the position of GSCM and competitive advantage can be a just-in-time system link to the company's performance. Based on the results of this study, recommendations that can be given to companies are to maintain a just-in-item system that has been carried out such as managing production costs, maintaining production levels, and providing good relations to suppliers. Not only that, companies must also continue to protect the surrounding environment by enacting environmentally friendly policies.

References


